



A.D. 1854 N^o 1858.

SPECIFICATION

OF

WILLIAM BROOKE.

CONSUMING SMOKE, &c.

LONDON:

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1855.



A.D. 1854 N° 1858.

Consuming Smoke, &c.

LETTERS PATENT to William Brooke, of 5, Martin's Lane, Cannon Street, in the City of London, Manufacturing Chymist, for the Invention of "CONSUMING SMOKE & CONDENSING NOXIOUS & OTHER GASES & VAPOURS, & CONVERTING THE PRODUCTS THEREOF TO VALUABLE PURPOSES, WHICH NOW ESCAPE TO THE INJURY OF THE ANIMAL & VEGETABLE LIFE."

Sealed the 6th February 1855, and dated the 24th August 1854.

PROVISIONAL SPECIFICATION left by the said William Brooke at the Office of the Commissioners of Patents, with his Petition, on the 24th August 1854.

I, WILLIAM BROOKE, of 5, Martin's Lane, Cannon Street, in the City of London, Manufacturing Chymist, do hereby declare the nature of the said Invention for "CONSUMING SMOKE & CONDENSING NOXIOUS & OTHER GASES & VAPOURS, & CONVERTING THE PRODUCTS THEREOF TO VALUABLE PURPOSES, WHICH NOW ESCAPE TO THE INJURY OF THE ANIMAL & VEGETABLE LIFE," to be as follows :—

10 By mingling the smoke with heated air, & passing the mingled smoke thro' a fire-box wherein is deposited a small quantity of charcoal or coke breezes, which are kept ignited by the mixt current, & convert the current of smoke into illuminous gas, which can be used for lighting or heating purposes.

15 The apparatuses required for these various purposes will be sett forth in the Complete Specification, with Drawings.

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SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said William Brooke in the Great Seal Patent Office on the 24th February 1855.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM BROOKE, of 5, Martin's Lane, Cannon Street, in the City of London, Manufacturing Chymist, send greeting. 5

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-fourth day of August, in the year of our Lord One thousand eight hundred and fifty-four, in the eighteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said 10 William Brooke, Her special licence that I, the said William Brooke, my executors, administrators, and assigns, or such others as I, the said William Brooke, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and 15 vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**CONSUMING SMOKE AND CONDENSING NOXIOUS AND OTHER GASES AND VAPOURS, AND CONVERTING THE PRODUCTS THEREOF TO VALUABLE PURPOSES, WHICH NOW ESCAPE TO THE INJURY OF THE ANIMAL AND VEGETABLE LIFE,**" upon the condition (amongst others) that I, the said 20 William Brooke, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent. 25

NOW KNOW YE, that I, the said William Brooke, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, reference being had to the Drawings hereunto annexed (that is to say):— 30

My Invention consists in consuming smoke and the products of combustion generated in the furnaces of steam boilers, and in ordinary and other fire-places, by causing such products to be passed while in the heated state through a second fire-place, wherein is deposited a quantity of charcoal or coke, breeze, or other suitable fuel, in an ignited state, and kept so ignited by the mixed 35 currents of heated air and smoke from the first furnace. The gases and other products, after passing through the second or charcoal fire, are caused by means of a fan blower or other suitable apparatus, to pass or circulate

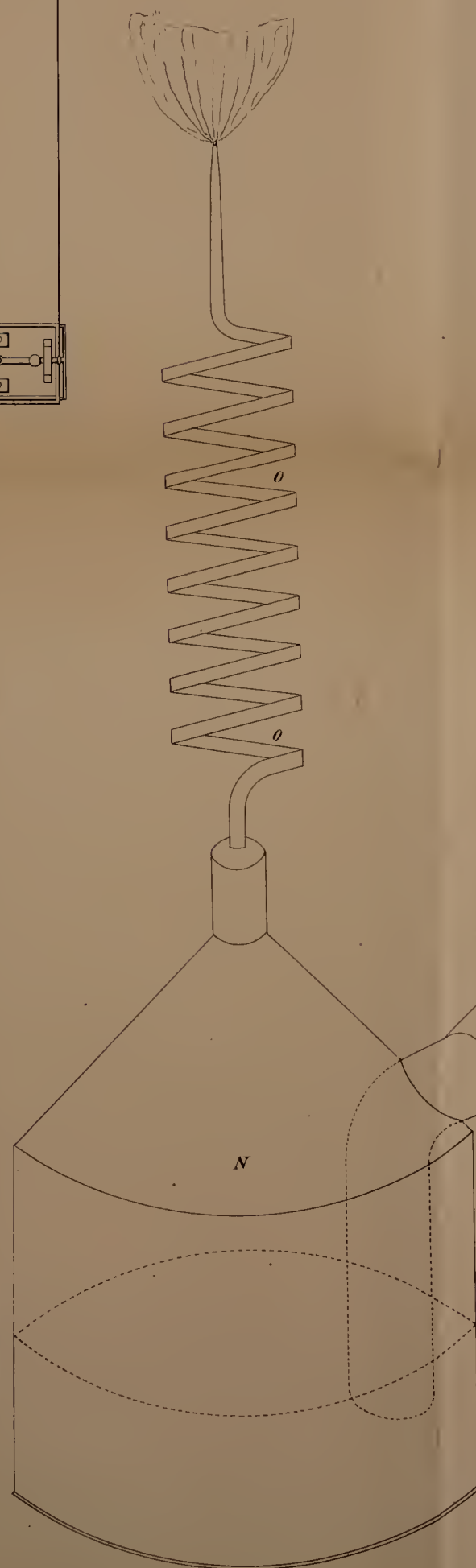
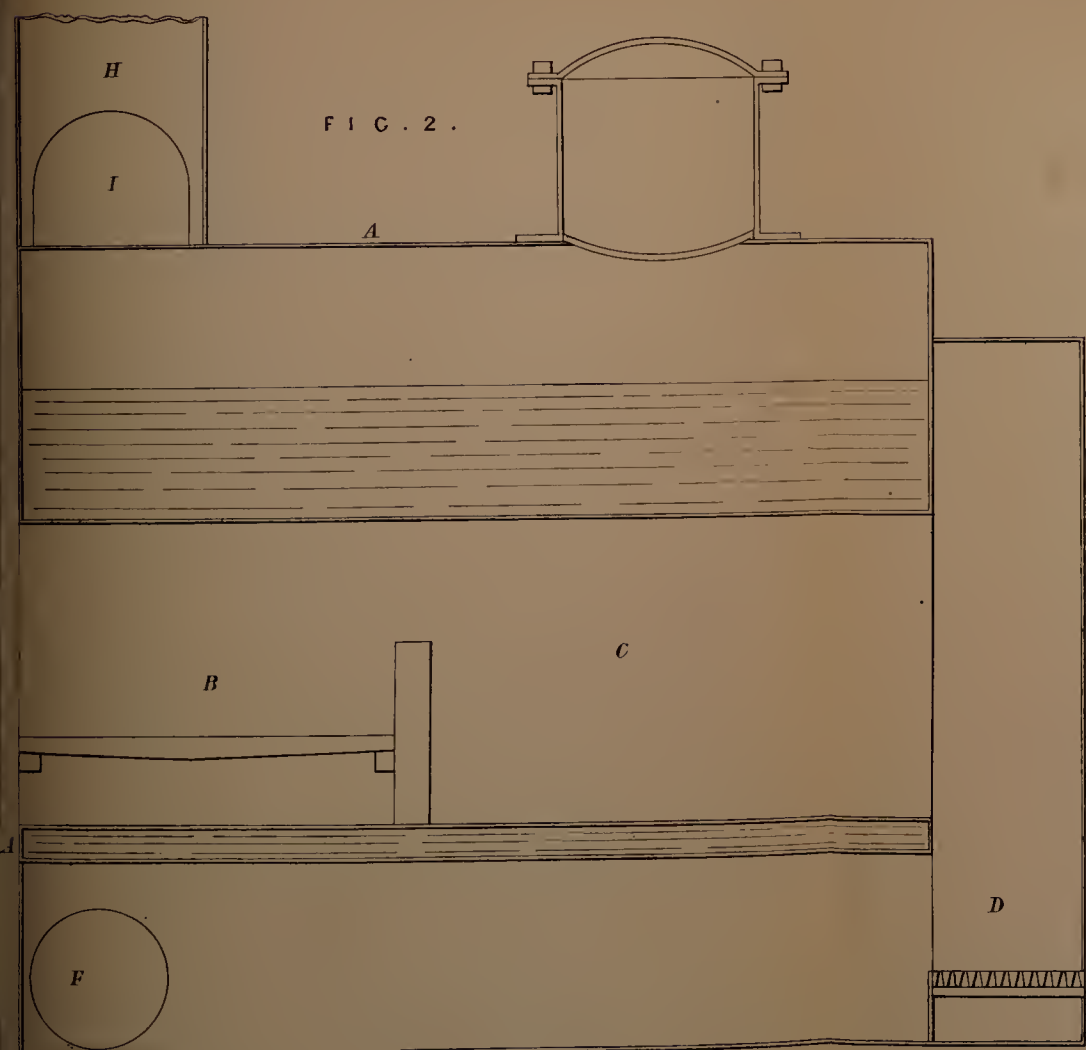
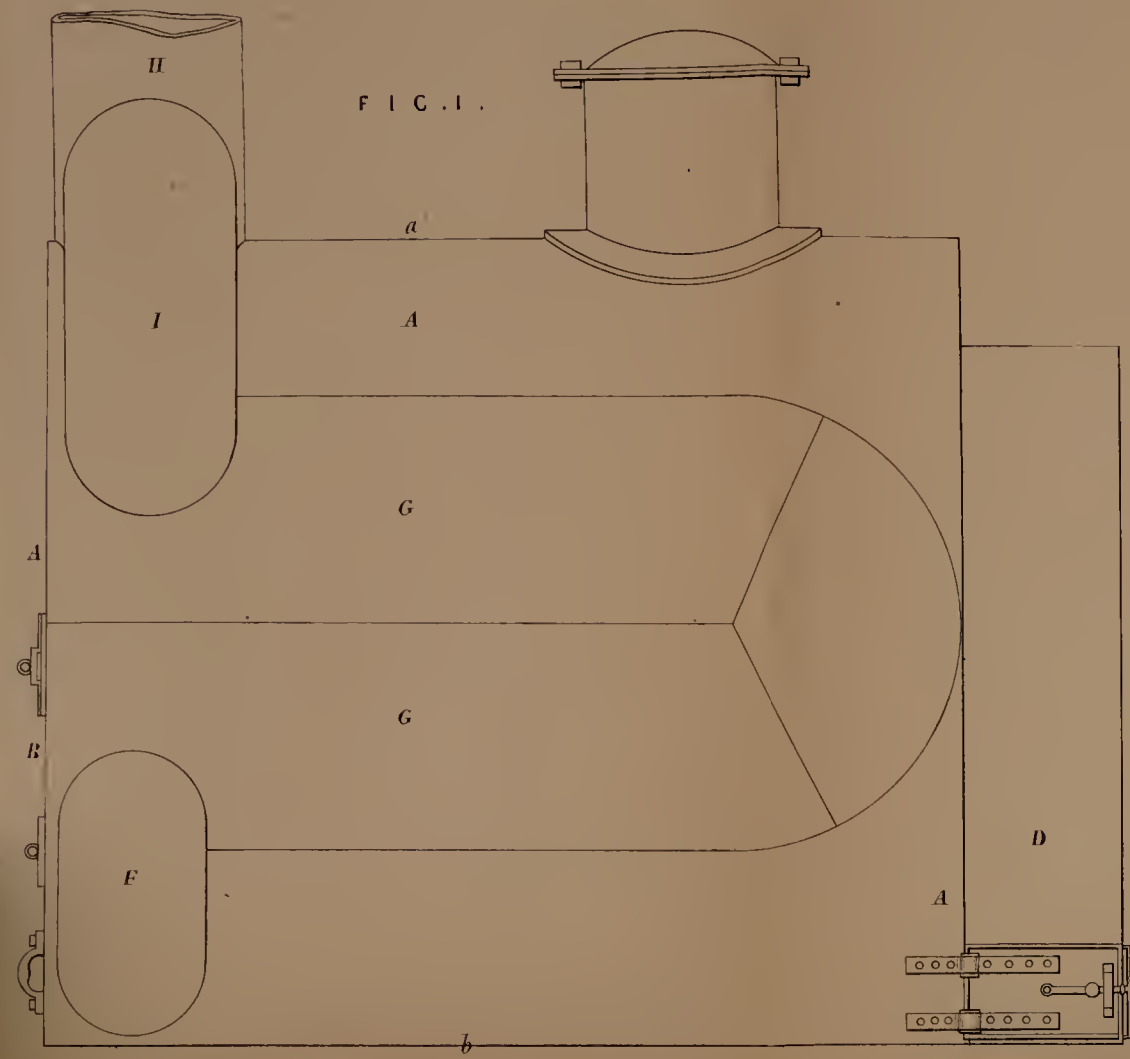


FIG. 4.

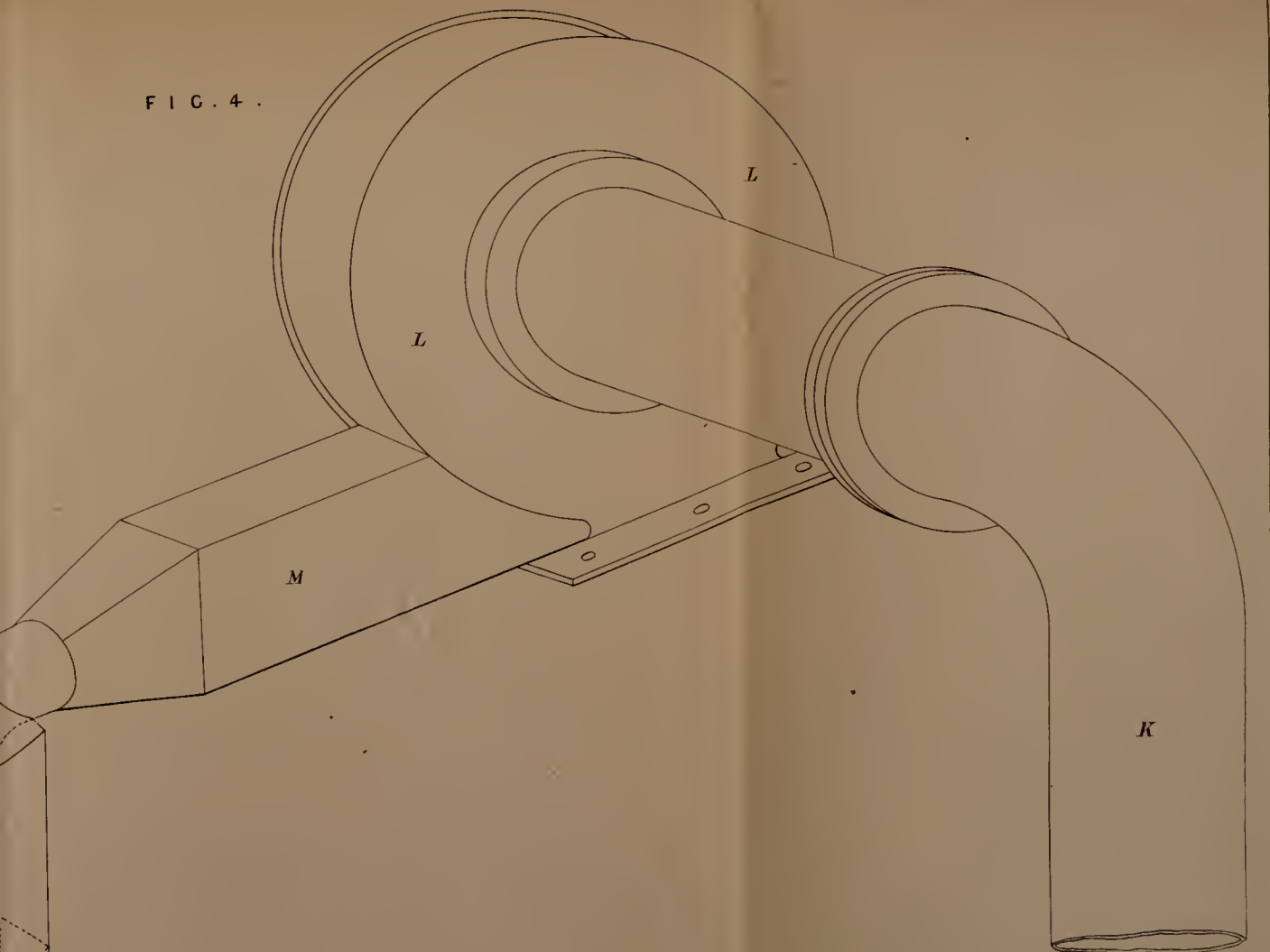
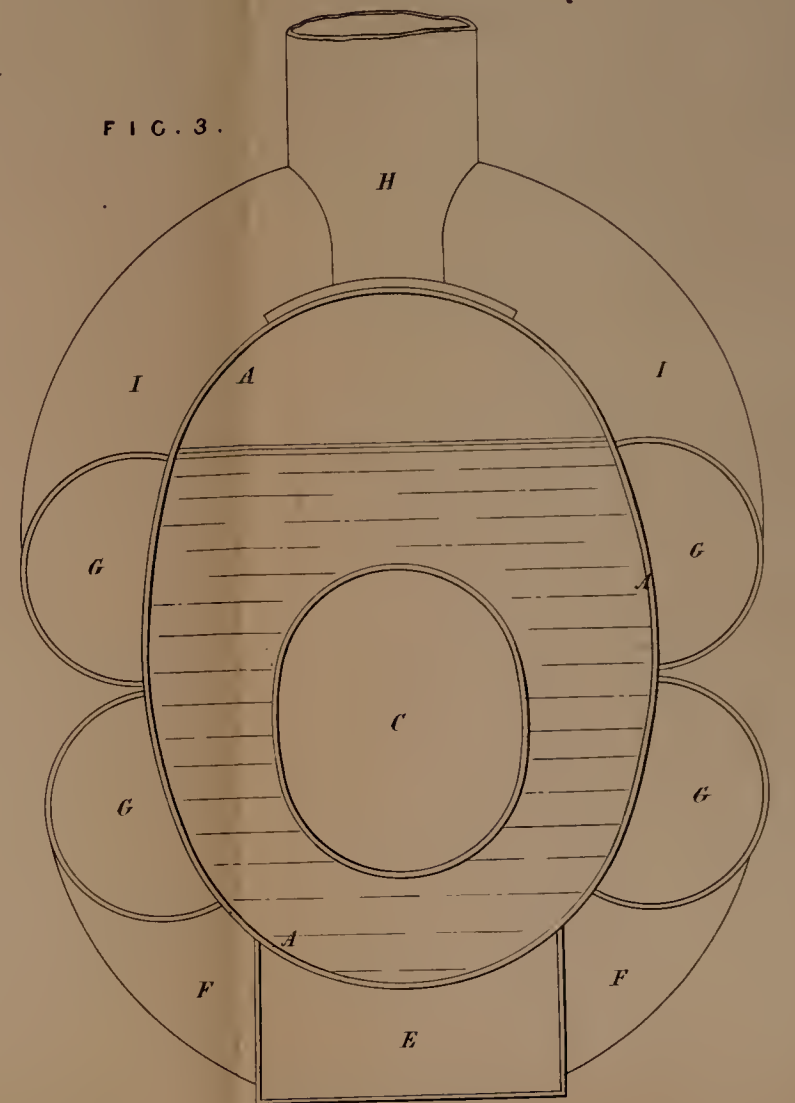


FIG. 3.





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through a condensing apparatus, wherein they become deprived of their noxious qualities, and escape to the outer atmosphere in a pure but heated state, and may be applied to various useful purposes, such as heating and warming, &c. The condensing apparatus which I prefer is composed of a
5 chamber or reservoir for containing an alkaline solution, such as lime and caustic potash; and the pipe leading from the fan, and conducting the heated vapors from the furnace, is caused to dip beneath the alkaline solution, and to discharge its contents into it. The vapors and noxious gases, as they percolate through this solution, become thereby purified; the lime in
10 the solution entering into combination with the carbonic acid gas, and the caustic potash forming an affinity for the sulphurous vapors. The vapours, after being thus purified, issue through a worm at the top of the chamber, and any steam that may be mixed with the vapours becomes condensed therein, and runs down into the chamber, and the pure but heated vapour alone issues
15 out through an orifice in the top of the worm. Should it be desired to convert the heated gases and vapours from the first and generating furnace into a gas for lighting and heating purposes, I dispense with the second or charcoal furnace, and pass the gases and vapours direct to the purifying chambers, where they become purified of their noxious qualities, and are converted into a
20 luminous gas.

In the Drawings hereunto annexed, I have shewn the manner in which I carry my Invention into effect, and represented it as applied to a steam boiler; Figure 1 being a side elevation; Figure 2, a longitudinal section; and Figure 3, a cross section on the line *a, b*, of Figure 1; Figure 4 represents a
25 perspective view of the fan blower and condensing apparatus. A, A, is the boiler, and B, the furnace in which the first fire is ignited, and where the smoke and other vapours are generated, which pass through the flue C and into the second furnace D. In this furnace the charcoal or coke, breeze, or other suitable fuel, is ignited, and the smoke and other products of com-
30 bustion are caused to pass through this fire, and thereby become partially consumed, and materially deprived of their noxious qualities; from thence the vapours in a highly heated state traverse along the return flue E at the bottom of the boiler, and up through the short connecting flues F, F, where they enter into and pass through the side flues G, G, imparting a large amount
35 of heat to the water in the boiler. From these side flues the vapours pass into the chimney H, through the connecting tubes I, I. To the top part of the chimney H, I attach the end of the tube K (Figure 4), which leads to the fan blower L, by means of which the draught is maintained through the second fire and flues. From the fan blower the vapours pass through the tube M,

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and into the condensing and purifying chamber N, which is partially filled with an alkaline solution, where they become further deprived of their impurities, and finally issue through the worm or coil O at the top of the chamber, where they may either blow off into an apartment to be warmed, or be conveyed through suitable pipes for the same purpose. To use the gas as 5 it issues from the coil for the purpose of illumination, I dispense with the charcoal fire in the furnace D, the other arrangements of apparatus being the same.

Although I have shewn my Invention as applied to a steam boiler, I do not confine myself thereto, as the same arrangement of the two fires, fan blower, 10 and condensing and purifying apparatus, may be applied with equal advantage to furnaces, domestic fires, and fires of other descriptions, where it is desirable to consume the smoke, and condense and purify the noxious and other gases and vapours arising therefrom, and convert the products thereof to useful and valuable purposes. 15

And having now described the nature of my said Invention, and in what manner the same is to be performed, I declare that what I claim is,—

The consuming smoke and condensing noxious and other gases and vapours, and converting the products thereof to valuable purposes, by means of the arrangement of apparatus by which the products of combustion are caused to 20 pass through a second fire of charcoal, coke, breeze, or other suitable fuel in an ignited state, and from thence by means of a fan blower to a condensing and purifying chamber, all as herein-before described and represented in the Drawings hereunto annexed. I also claim the passing the products direct from the first furnace to the purifier in the manner and for the purpose 25 herein-before described.

In witness whereof, I, the said William Brooke, have hereunto set my hand and seal, this Twenty-fourth day of February, One thousand eight hundred and fifty-five.

WILLIAM BROOKE. (L.S.) 30

LONDON:

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